

The production of this new edition has been an enormous task, and has entailed a great amount of very hard labor. The writer wishes to call the reader's attention to the painstaking work and research of Dr. Holland, who visited the various museums to study their types and other material, and to discuss the involved taxonomic problems with the curators. These visits from Dr. Holland were not only pleasant and stimulating but have given us a personal interest in the Butterfly Book.—FRANK E. WATSON, American Museum of Natural History, New York, N. Y.

**REVIEW OF THE THIRD EDITION OF SANDERSON'S
AND PEAIRS' "INSECT PESTS OF FARM,
GARDEN AND ORCHARD"**

BY J. S. WADE

Insect Pests of Farm, Garden and Orchard. By E. Dwight Sanderson. Third Edition, revised and enlarged by Leonard Marion Peairs. New York, John Wiley & Sons, Inc., octavo, 568 pp., 607 figs., 1931. \$4.50.

It is a significant indication of the practical value of the results obtained by present-day workers in economic entomology that the standard books on the subject require revision at quite frequent intervals. It is always of interest to compare the latest with earlier revisions that one may note the extent of progress which investigators have made during a given period. This is particularly true in the case of the well-known volume under consideration, for it has had an interesting and an honored history and has been a valued and much used tool in very nearly every entomological workshop.

It was as early as 1902 that Professor E. Dwight Sanderson, realizing that the information most frequently needed on control of many of our greatest insect pests was quite widely scattered through such original sources as the publications of the U. S. Department of Agriculture, the various State experiment stations, and books on economic entomology, undertook to assemble data most needed in a convenient and readily accessible compilation. This little 12mo. volume comprised only 295 pages and 162 figures and bore the title "Insects Injurious to Staple

Crops." The work proved to be so useful and so popular that after a ten-year interval the publishers, in issuing a new edition, requested a revision. It was found, however, that the advances in economic entomology during the entire interval had been so great that it was necessary practically to rewrite the book. The project was developed into a volume issued in 1912, bearing the title "Insect Pests of Farm, Garden and Orchard." This work, too, proved to be of unusual excellence, and it was necessary to issue in 1921 a second edition, 12mo., 707 pages, 604 figures, revised and enlarged by Dr. Leonard Marion Peairs. The scope of such a compilation may be realized when it is noted that all the leading authorities on the subjects under consideration were consulted and the compilers endeavored to evaluate and to present their evidence with such interpretation as their personal knowledge made possible.

It is with a deep feeling of personal gratitude that the reviewer acknowledges his personal indebtedness to these two editions. The data included were presented in such compact and accessible form as to render them not only suitable for office correspondence and laboratory use, but were also readily portable and hence available while the reviewer was in travel status. Through courtesy of the publisher it is, therefore, with especial pleasure that this review is undertaken.

Concerning this new edition the authors modestly state that they "fully realize that a book of this nature begins to be out of date the day it is published and becomes more so each day." "However, a student with an inquiring mind will readily see that Economic Entomology is a living subject and that it presents unsolved problems which invite investigation." In the present edition only a few of the original articles of the first edition by Doctor Sanderson remain more or less intact. It, however, has been almost entirely rewritten by Doctor Peairs and much new material and many new illustrations have been included, and the entire volume reset to a larger size page. The various subdivisions of the book include treatment of such topics as estimates in dollars of injury to crops by insect pests; structure and development of insects; general, cultural, mechanical, biological and chemical methods and apparatus on insect con-

trol; insects affecting miscellaneous garden, grain and forage crops, grasses and grains, clovers and alfalfa, beans, peas, cruciferous and solanaceous crops, cucurbits, beets and miscellaneous garden crops, pests of southern field crops—cotton, tobacco, sugar-cane and rice. The matter on fruit insects includes treatment of those generally injurious in the orchard and specifically those destructive to apple and pear, stone fruits, grapes, small fruits, and citrus fruits. There are chapters dealing with the pests injurious to stored grains, foods and fabrics, as well as those affecting livestock, poultry and mankind. An excellent, thoroughly workable index is appended. One of the features of special value in this, as in previous editions, is the generous citation page by page of references to latest literature on the particular topic under discussion.

It is illuminating to compare sections of this third edition page by page with the first and second editions if one merely notes some of the more outstanding additions in recent years. These include discussion of such topics as insecticides, notably calcium arsenate and magnesium arsenate, or latest developments in control of insect pests such as European corn borer, Mexican bean beetle, sweet potato weevil, Mexican cotton boll-weevil, pink boll-worm, Japanese beetle, Oriental fruit moth, or Mediterranean fruit fly. On the whole this third edition appears fully up to the high standard of its predecessors and the authors are to be congratulated upon work well done and well worth while.